

Chapter 13

Maintaining and troubleshooting Meridian Link

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Maintenance and diagnostic tools

Introduction

Symposium Call Center Server Release 4.0 includes a number of maintenance and diagnostic tools to assist technicians with maintaining and troubleshooting the operation of the Meridian Link. These tools are normally used to query the status of Meridian Link-related processes and resources, and to trace the message flows associated with Meridian Link operation.

In the Symposium Call Center Server, most Meridian Link activity is handled by the following processes:

- **MLSM**—Meridian Link Services Manager is responsible for the message flow between the external, third-party Meridian Link-based application and Telephony Services Manager (TSM).
- **TSM**—Telephony Services Manager is responsible for handling MLSM requests to acquire and monitor resources, and to register applications and DNs. It is also responsible for all of the message flow between the MLSM process and the Meridian 1 over the Application Module Link (AML).

Note: Due to the architectural differences between the current Application Module-based Meridian Link (AM Meridian Link) product and MLSM on Symposium Call Center Server, there are significant differences in the tools that are used for maintenance and diagnostic purposes.

Application Simulator tool

Use this tool to simulate an application that uses the same TSM API that is available to the other applications (for example, MLS, ASM, and TFE). With this tool, you can

- verify the status of the links (AML and Access)
- test the acquiring process
- test monitoring

If you suspect that TSM is acting abnormally, then this is the most appropriate tool to use.

Meridian Link API tool

Use this tool if you suspect that MLS is causing problems. The tool simulates a Meridian Link application. With this tool, you can verify

- Meridian Link connectivity
- the registration process
- the general state of MLS (whether various functions are working correctly and being propagated to TSM and Meridian 1, and whether response messages are built correctly, and so on)

SMonW

Use this tool to query the status of Symposium Call Center Server services. The most common status values are described in the following table:

STARTING	When the system first comes up, most services have this status.
UP	During a normal startup, services move into this status from STARTUP.
UNKNOWN	Services have this status if they are down. This status can mean that a service has been shut down, or that it has crashed. The tool does not indicate which condition applies.

For more information, see the *Software Installation and Upgrade Guide*.

Performance Monitor

Use this tool to diagnose details of system utilization. You can use this tool to analyze each process or service, or even individual threads. With this tool, you can monitor memory use, processing time, and a variety of other factors.

Services Manager

Use this tool to start up or shut down services, or to view the status of a service. The only status reported in this window is Started. In most circumstances, this is equivalent to SMonWs UP status.

Meridian Link Trace tool

Use this tool to turn on and off tracing and recording of message flow between the Symposium Call Center Server and the external Meridian Link application. This tool provides the same functionality as the Meridian Link User (mlusr) commands on the AM Meridian Link provide to the Application Module-based Meridian Link product.

Telephony Services Manager OA&M

Use this tool to trace the following:

- AML messages
- Access link messages
- messages for each application association (that is, from TSM to MLS)

You can also use this tool to query application associations and resources (that is, registered applications and monitored or acquired devices). TSM OAM provides functionality that is similar to that provided by Meridian Link User (mlusr) commands on the AM Meridian Link.

Meridian Link troubleshooting

Introduction

This section provides guidelines for troubleshooting problems with Meridian Link.

To troubleshoot problems with Meridian Link applications

- 1 Use the Meridian Link Trace tool to verify the validity of the third-party Meridian Link application's actions (that is, make sure that the requests the application is making are correct and valid).
- 2 If the requests and responses are correct, and the problem is with the message content, kinds of messages received, execution of a request, and so on, use the Meridian Link API tool to verify that MLS is operating correctly.

If this tool does not reveal problems, the problem is probably with the third-party application.
- 3 If the Meridian Link API tool reveals problems, use the Application Simulator tool to verify the links, and make sure TSM is operating properly.

If this tool does not reveal problems, the problem might be caused by
 - problems within the MLS process
 - user errors, such as failure to register an application or acquire devices
- 4 If the Application Simulator tool reveals problems, use the TSM OA&M tool to troubleshoot TSM.

To troubleshoot failure to respond by MLSM process

- 1 Use SMonW or the Services Manager to see if MLSM has been started.

If the service is up in one window but down in the other, MLSM has crashed. Check the event log (the server might have logged appropriate error messages), and use the Meridian Link Trace tool to find out why.
- 2 If both SMonW and the Services Manager indicate that the service is up, try connecting, registering, and using the Meridian Link API tool.

If you cannot connect, register, or send messages, then MLSM is in an unusable state (even though it has not crashed). Use the Performance Monitor to see if MLS has a heartbeat (that is, see if there is a sign of any activity from the MLS threads or process). Although this does not remedy the situation, it can provide a clue to technicians as to what went wrong.

3 Restart the MLSM service.

Using the Meridian Link API tool

Command line options

The Meridian Link executable can be run with four command line options:

- p: (processing)—prevents the tool from translating the hex-stream into a semi-English format, used to increase the tool's processing speed
- bo: (buffer out)—prints the outgoing hex-stream
- bi: (buffer in)—prints the incoming hex-stream
- np: (no poll)—stops automatic poll response

To start the Meridian Link API tool

- 1 Check SMonW to make sure that the TSM and OAM services are up.
- 2 If you want to log on agents, make sure that ASM is up.
- 3 Run MLS on the server either as a service or a process.
- 4 Run mlink_tool.exe by double-clicking the file in Windows Explorer. The file is located in the path Nortel\iccm\bin.

- 5 Type the CLAN IP address of the server to which you want to connect (the one running MLS). Press Enter.

Result: The API Tool menu appears.

```
API Tool
-----
1  Quit
2  Tag/Msg Administration
3  Send a message
4  Receive messages
5  Set Options
```

Note: If the tool window disappears, MLS is probably not up yet. Wait a few minutes and try again.

To register an application

- 1 Type **3** (Send a Message) and press Enter.

Result: The following main menu appears:

```
Send ML Message
-----
1   Previous Menu
2   Registration
3   Resource Acquisition
4   Call Processing
5   Voice Processing
6   Link Status
7   Administration
8   Use Script File
9   Any Message
10  Raw Message
```

First, you must always register an application. You can do so using a script (see "About scripts" on page 327) or manually, using the menus. For this procedure, use the sample script in "Application Registration" on page 327.

- 2 Type **8** (Use Script File), and press Enter.

Result: The tool prompts for the file name.

- 3 Type the complete path name for the script file (for example, d:\nortel\iccm\applreg01.srp).

- 4 For the number of iterations (the number of times you wish to execute the script file), type **1**.

Result: After a few seconds, you should receive a confirmation from MLS showing the result of your request:

```
Received : REG_APPL_RSPNS
ML_ASSOC_ID: 1
```


ML_REF_ID: 32768

ML_NUM_SERVICES: 0

ML_SERV_LIST: NONE

ML_STATUS: 0

ML_CAUSE: NONE

- 5 If you want to register other applications, run `mmlink_tool` again and repeat steps 1 to 4.

Understanding the results

The following table describes the components of this message:

Component	Description
ML_ASSOC_ID	A unique non-zero ID that represents this particular client application. All messages sent to MLS from this application must use this association ID.
ML_REF_ID	(Optional) An identifier used by a client application to pair requests and responses (see Interface Specification on appropriate reference ID usage). Unsolicited messages sent by MLS have an ML_REF_ID of 0 (as no client message was sent requesting it).
ML_STATUS/ ML_CAUSE	A value other than 0 or NONE, respectively, indicates the request failed. Thus, if a status or cause value greater than 0 appeared in the registration application response message above, the application was not able to register (see Interface Specification for meaning of cause value).

Poll requests

You can request polling in your script by entering a value from 1 to 60 (poll times in increments of 10 seconds) in the second-last field in the application registration. If you do not request polling in your script, but you acquire a resource, polling is automatically enabled, and the poll time is set to six (one minute).

Polling messages appear if there is no message flow for the poll time

Received : ASSOC_POLL

ML_ASSOC_ID: 1

ML_REF_ID: 0

and the Meridian Link API tool's response is

Returning Poll...

Polling messages do not affect the tool in any way, so if one appears while you are entering information, ignore it. They simply let you know that the connection is still alive (and remind you of the assoc_id).

To register and release DNs and position IDs

- 1 Make sure the switch has all of the DNs, Position IDs, CDNs, and so on, configured correctly. Keys corresponding to DNs or Position IDs should be set with the AST option. If you are using CDNs for applications other than Symposium Call Center Server, verify that the default ACD group is the group to which your Position IDs belong.
- 2 The easiest method to register is through scripts (see "DN or Position ID registration" on page 327). However, the manual method is fairly quick. To use the manual method, from the main menu, type **2** (Registration) and press Enter.
- 3 Choose DN registration.
Result: The following prompt appears: ML_ASSOC_ID [numeric]
(NONE) > .
- 4 Type the association ID of the application and press Enter.
Result: The following prompt appears: ML_REF_ID [numeric]
(NONE) > .
- 5 Optionally, type a reference ID and press Enter. If you do not want to use a reference ID, simply press Enter.
Result: The following prompt appears: ML_NUM_DN [numeric]
(NONE) > .
- 6 Specify the number of DNs you want to register, and press Enter.
Result: The following prompt appears: ML_DN_LIST [string list]
(NONE) > .

- 7 Enter the DNs you want to register. To enter multiple DNs, separate them by spaces, as in the following example:

```
ML_DN_LIST [string list] (NONE) > 3153 3154 2153
```

Result: The following prompt appears: ML_DN_TYPES [numeric list] (NONE) > .

- 8 Enter the types of the DNs you want to register. If you entered multiple DNs, you must specify the type of each DN, separated by spaces, as in the following example:

```
ML_DN_TYPES [numeric list] (NONE) > 129 129 130
```

The following table lists valid types:

For DNs of type	enter
DNs, ACD-DNs, CDNs	129
Position IDs	130

Result: The following prompt appears: ML_MORE [numeric] (NONE) > .

- 9 Type a dash (–) and press Enter.

You release DNs and Position IDs in the same way, from the same menu. You should release all acquired devices at the end of testing.

Testing

Now that the application is registered and devices have been acquired, you can execute the other functions. If you want to do any repeat testing (for example, make a call, answer a call, and repeat this 1000 times), you must use a script (for the number of iterations, enter the number of times you want the script to execute). For simple one-time commands, use the menu. All call processing (make-call, answer-call, release-call) is under Call Processing in the main menu. If you want to acquire a CDN or Voice Channel (which has been configured correctly on the switch or Meridian Mail), use Resource Acquisition. For tests involving more complex commands, refer to the Interface Specification and full.txt for message requirements, formats, and so on.

About scripts

Scripts save you time because they

- allow you to easily enter the same information many times
- allow the tool to send out requests more quickly (this is important when response is needed within a time limit)
- permit multiple processing of requests (that is, being able to make a call several times)

However, you often have to modify scripts.

Application Registration

The script (applreg01.srp) looks like this:

```
REG_APPL_REQ      |1|-|endurance|-|3|97 98 100|-|-|0|SL16|-|-|-|
```

where	is
the string in caps	the message type. You only need to look up the type (if it is not already in the menus) in one of the header files.
field 3 (endurance)	the application's string ID. This is any name you want to provide. If you are running multiple client applications, simply change this name, save the file under a new filename, and use this file instead of applreg01.srp for the new applications registration process.
field 9 (0)	the customer number. You might need to adjust this number so that devices can be acquired correctly. Do this before registering.

Fields are delimited by the | character.

DN or Position ID registration

You can register DNs and position IDs manually (see "To register and release DNs and position IDs" on page 325), or with a script like the following (dnreg01.srp):

```
REG_DN_REQ|1|-|1|3118|129|-|
DELAY 3
```



```
REG_DN_REQ|1|-|1|2119|130|-|  
DELAY 3
```

The following table describes the fields for the REG_DN_REQ statement in the script. These fields correspond to the prompts displayed when you register DNs and position IDs manually:

Field	Description
1 (ML_ASSOC_ID)	A unique non-zero ID that represents this particular client application. All messages sent to MLS from this application must use this association ID.
2 (ML_REF_ID)	(Optional) An identifier used by a client application to pair requests and responses (see the Interface Specification on appropriate reference ID usage). Unsolicited messages sent by MLS have an ML_REF_ID of 0 (as no client message was sent requesting it).
3 (ML_NUM_DN)	The number of DNs and Position IDs you want to acquire.
4 (ML_DN_LIST)	The DN or Position ID to be acquired, as configured on the switch.
5 (ML_DN_TYPES)	The DN type, either 129 (for DNs, ACD-DNs, or CDNs), or 130 (for position IDs).
6 (ML_MORE)	Specifies whether to continue entering information.

You can use the DELAY command at any time. It causes the tool to pause for the given number of seconds before continuing. The delay can be zero seconds or more. This is most useful for the action scripts.

Action Scripts

These scripts, which are used for the actual testing, include stress01.srp and full.txt. The script stress01.srp simply makes some calls from DNs to DNs, delays a few seconds, answers the calls, and delays again:

```
APPL_MAKE_CALL |1|-|8|3150|-|8|3151|-|1|  
APPL_MAKE_CALL |1|-|8|3152|-|8|3153|-|1|
```


DELAY 2

ANSWER_CALL | 1 | - | 8 | 3151 |

ANSWER_CALL | 1 | - | 8 | 3153 |

DELAY 2

The following table describes the fields for the APPL_MAKE_CALL statement in the script:

Field	Description
1	Association ID. A unique non-zero ID that represents this particular client application. All messages sent to MLS from this application must use this association ID.
2	(Optional) Reference ID. An identifier used by a client application to pair requests and responses (see the Interface Specification on appropriate reference ID usage). Unsolicited messages sent by MLS have an ML_REF_ID of 0 (as no client message was sent requesting it).
3	The DN type, with one of the following values: ■ 8 (internal DN) ■ 16 (ACD-DN) ■ 22 (CDN) ■ 30 (position ID)
4	Origination address (the call from phone).
5	Destination address (the phone being called).
9	Manner. This field has the following values: ■ 0 (polite—only goes through if the destination is free) ■ 1 (belligerent—goes through even if the destination is busy) The example script uses the belligerent manner because calls are not released at the end of each cycle. Therefore, on the next pass, the destination is busy.

For the ANSWER_CALL statement, the fields are assoc_id, ref_id, type, and origination. If the types are now getting confusing, leave them out. As far as origination is concerned in this last context, it refers to the DN or Position ID from which you want to answer the call.

Error messages and unsolicited messages

An important part of using the tool involves understanding the parts of the incoming messages. You are likely to receive the following messages:

- register application response
- DN register response
- call service response (for example, answer call or release call response)
- call progress
- call offered
- unsolicited status
- polls

The key is to check the STATUS and CAUSE values. A value other than 0 or NONE is an error, and must be examined. The following table shows errors and possible causes. For other messages (or specific cause values), refer to the Interface Specification. If the cause of the error is not self-explanatory, contact your Nortel Networks Customer Support representative.

Message response that received non-zero

STATUS/CAUSE value	Possible cause
application registration rspns	■ The TSM is not up, or needs to be restarted. ■ The MLSM version is incompatible with TSM/dlls. ■ The Service list is (partially) invalid. ■ The Application ID has already been used by an existing application.

**Message response that
received non-zero
STATUS/CAUSE value****Possible cause**

dn registration rspns

The switch is not configured correctly. Make sure the keys corresponding to DN/PosID are AST and not already acquired by another server.

call service rspns

Trying to make a call from Position ID. SECU field in overlay 17 is set to NO for this ELAN.

Using the Meridian Link Trace tool

Introduction

You can use the trace tool to turn on and off tracing and recording of message flow between the Symposium Call Center Server and a host computer running a Meridian Link application.

Trace file

The trace file generated by this tool is called `MLSMTraceFile.txt`. It is stored in the `Nortel\iccm\bin` directory. This method of tracing Meridian Link messages is equivalent to tracing link 1 under Meridian Link Release 4 or 5.

To enable tracing

- 1 Start the Meridian Link Trace tool by double-clicking `ml_trace.exe` in the Windows Explorer, or running it from a Windows command line. The file is located in the path `Nortel\iccm\bin`.

Result: An ICCM Meridian Link Services Manager Trace Tool window appears.

- 2 Click Configuration and select Trace.

Result: A dialog box appears.

- 3 Choose the association IDs of the applications you want to trace.

- 4 Click ON, and then click Activate.

- 5 Click Done.

Result: The dialog box disappears.

- 6 When you are finished, turn off tracing by clicking Configuration, selecting trace again, clicking OFF, and then clicking Done.

For tracing of AML messages, similar to a link 0 trace under Meridian Link Release 4 or 5, use the TSM OA&M (see the following section).

Using the TSM OA&M tool

Introduction

You can use the TSM OA&M tool to perform the following tasks:

- Query TSM for information about one session (association) or all sessions.
- Query TSM for information about acquired resources.
- Query TSM for information about monitored resources.
- Turn AML tracing on and off.
- Trace TSM sessions (applications).
- Turn ACCESS tracing on and off.

Stopping traces

Traces do not stop when you exit the TSM OA&M tool. You can stop a trace from the session in which you start it, or from another session (that is, after exiting and restarting the tool).

No trace status querying

You cannot check whether tracing is on or off. However, the tool allows you to turn on a trace that is already active and turn off a trace that is inactive. If you attempt to turn on a trace that is active, the program asks whether you want to clear the current trace file or append to it.

To start the TSM OA&M tool

- 1 Check SMonW to make sure that the TSM service is up.
- 2 If you want to turn on AML tracing, make sure that the Ethernet connection to the switch is active.
- 3 If you want to turn on ACCESS tracing, make sure that the ACCESS connection to Meridian Mail is active.

To query TSM for information about acquired resources

- 1 Type 3 (Query Acquired Resources), and press Enter.

Result: The program prompts Enter Session ID :

- 2 Type the session number and press Enter. (To find out the session number, use the Query Sessions option.)

Result: The tool shows information about resources acquired by the specified session.

```
PRIM_QUERY_ACQUIRES_RESP received
Request Parm
Association ID = 1
Reference ID = 47

##### ACQUIRES #####

TSM Session ID = 3

TN = (Loop=12, shelf=0, card=8, unit=6), Device ID = 101
Monitor Mask, CP=0x3AF1198, DM=0x1F3DFB0, exclusive acq,
Pos ID=2993

TN = (Loop=12, shelf=0, card=8, unit=5), Device ID = 100
Monitor Mask, CP=0x3AF1198, DM=0x1F3DFB0, Pos ID=5356
##### END ACQUIRES #####
```

To query TSM for information about monitored resources

- 1 Type 4 (Query Monitored Resources), and press Enter.

Result: The program prompts Enter Session ID :

- 2 Type the session number and press Enter. (To find out the session number, use the Query Sessions option.)

Result: The tool shows information about resources monitored by the specified session.

```
PRIM_QUERY_MONITORS_RESP received
Request Parms
Association ID = 1
Reference ID = 48

##### MONITORS #####

TSM Session ID = 3

TN = (Loop=12, shelf=0, card=8, unit=6), Device ID = 101
Monitor Mask, CP=0x3AF1198, DM=0x1F3DFB0

TN = (Loop=12, shelf=1, card=8, unit=13), Device ID = 96
Monitor Mask, CP=0x3AF1198, DM=0x1F3DFB0

##### END MONITORS #####
```

To enable tracing for a TSM session

- 1 Type 5 (Enable Session Trace), and press Enter.

Result: The tool prompts for the session ID.

- 2 Type 0 to enable tracing for all sessions, or type the session ID. Then press Enter. (To find out the session number, use the Query Sessions option.)

Result: The tool prompts Enter a File Name or simply press ENTER to choose `tsmnnn.trc`, where *nnn* is the session number. For example, if you enable tracing for session 2, the trace file name is `tsm002.trc`.

Notes:

- If you enable tracing for a session for which tracing is already active, the tool prompts for a new trace filename. If you enter a new trace filename, the open trace file is closed. If you enter the trace filename that is in use, you can choose whether to clear it or append to it.
 - When you enter 0, tracing is enabled for all sessions registered at the time of the request. To trace new sessions, you must enable tracing again.
- 3 If you want to use a different file, type the filename.
 - 4 Press Enter.

Note: Polling messages are not logged to the trace file.

To disable tracing for a TSM session

- 1 Type **6** (Disable Session Trace), and press Enter.

Result: The tool prompts for the session ID.

- 2 Type **0** to disable tracing for all sessions, or type the session ID. Then press Enter. (To find out the session number, use the Query Sessions option.)

Result: The tool displays the message PRIM_TRACE_OFF_RESP received.

To enable AML tracing

- 1 Type **7** (Enable AML Trace), and press Enter.

Result: The tool prompts Trace File Name.

- 2 Type the filename and press Enter.

Result: The tool displays the message PRIM_TRACE_ON_RESP received.

To disable AML tracing

Type **8** (Disable AML Trace), and press Enter.

Result: The tool displays the message PRIM_TRACE_OFF_RESP received.

Appendix A

Troubleshooting

In this appendix

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Overview

Introduction

This section provides troubleshooting checklists and procedures in case you experience any problems with the application software or with connecting to the network or server.

Troubleshooting problems with application software

Introduction

Problems with the client application software can result from improper network cabling, improper network card configuration, and incorrect configuration of Windows NT on the server.

To troubleshoot problems with the client application software

- 1 Ensure that all cables are installed correctly. See the maintenance guide for your server for detailed information.
- 2 Verify that the system board jumpers are set correctly. See the maintenance guide for your hardware platform for detailed information.
- 3 Verify that the Windows NT is properly configured for the system. See the *Software Installation and Maintenance Guide* for instructions on configuring Windows NT.

If the problem persists, contact your Nortel Networks Customer Support representative for assistance and more information.

Troubleshooting the connection to the server

Introduction

If the client cannot connect to the server, it displays a dialog box with the message IP address is unreachable. Connection failed. Click OK to dismiss the dialog box, and follow the steps in this section to solve the problem.

ATTENTION

If you discover that you must change the server's CLAN or ELAN IP address, see the *Software Installation and Maintenance Guide*. You must make IP address changes in Symposium Call Center Server utilities as well as in the Network control panel.

Things to check first

- 1 Make sure that you are using the drivers that are shipped on the system configuration software CD for the CLAN/ELAN network controller.
- 2 Make sure that the driver is loaded and the protocols are bound.
- 3 Ensure that the network cable is securely attached to the connector at the system back panel and that the network controller link LED is on and visible at the back panel. If the cable is attached but the problem persists, try a different cable.
- 4 Ensure that the hub port is configured for the same duplex mode as the network controller.
- 5 Check with your LAN administrator about the correct networking software that needs to be installed.
- 6 If you are directly connecting two servers, some hubs might also require a crossover cable. Check your hub documentation for more information on crossover cables.
- 7 Check the visible network controller LEDs through an opening at the system back panel.

- 8 From the client, try to ping the server's CLAN IP address. If you are using a dial-up connection, establish the modem connection before pinging.

Result: If the ping is successful, then the network is fine between the server and the client. If the ping is not successful, then you might be using the wrong IP address for the server, or there might be a network problem.

To check the client PC

If using a dial-up connection to the server

- 1 Check that the Dial-Up Networking connection profile that you are using for the SMI system to connect to the server is set up correctly. Check that the dial-up connection information is correct (IP address for the server and phone number).
- 2 Try to connect to other PCs on the local network to ensure that you are not having a local network problem.

If connecting to the server over the LAN

- 1 Check that the connection information for the SMI system is correct (IP address or computer name for the server). See "Adding servers" on page 12.
- 2 Try to connect to other PCs on the LAN to ensure that you are not having a local network problem.

To check the server

- 1 Check that the network card TCP/IP addresses are correct. See the *Software Installation and Maintenance Guide*.

Note: If you must change the server's CLAN or ELAN IP address, see the *Software Installation and Maintenance Guide*.

(The remaining steps apply only if the client is using a dial-up connection to the server)

- 2 Check that the client PC's IP address is in the range of IP addresses defined for Remote Access Service (RAS) on the server. See the *Software Installation and Maintenance Guide*.
- 3 Check that Remote Access Service is started. See the *Software Installation and Maintenance Guide*.

Troubleshooting problems with the network

Network problems

If you are having network problems, check the following list for possible solutions.

The network driver fails to start or hangs the server on starting

- Use the SCU software to verify interrupt and other system resource settings. For more information, refer to the *Software Installation and Maintenance Guide*.
- Verify that the proper Windows NT Service Pack is loaded.
- Verify that diagnostics on the card pass.

Diagnostics pass but the connection fails

- Ensure the network cable is securely attached.
- Ensure you specify the correct frame type in your net.cfg file.

The Link LED does not light

- Ensure you have loaded the network drivers.
- Check all cable connections.
- Try another port on the hub.
- Ensure you have the correct type of cable between the adapter and the hub. Some hubs require a crossover cable, while others require a straight-through cable. For more information about crossover cabling, see the manufacturer's hub directions.

The Activity LED does not light

- Ensure you have loaded the correct network drivers.
- The network might be idle. Try to access a server.

The controller stopped working when an add-in adapter was installed

- Ensure the cable is connected to the port from the onboard network controller.
- Ensure your PCI BIOS is current. Try the “PCI installation tips” on page 348.
- Ensure that the adapter is not attempting to share interrupts, since Windows NT does not support shared interrupts. See the “PCI installation tips” on page 348.
- With the system powered down, try reseating the add-in adapter.

The add-in adapter stopped working without apparent cause

- With the system powered down, try reseating the adapter. If the problem persists, try installing the card in a different slot. This helps you identify whether the problem is with the adapter or with the slot.
- The network driver files might be corrupt or deleted. Delete and then reinstall the drivers.
- Run the diagnostics.

Troubleshooting problems with pcAnywhere

Starting pcAnywhere

A blue screen appears when restarting pcAnywhere after Version 9.2 installation

This is caused by an incompatible video driver in Windows NT.

- 1 Press Reset to restart Windows NT.
- 2 When prompted, select the option to run Windows NT VGA mode.
- 3 When the message Last Known Configuration appears, press Reset.
- 4 Repeat steps 2 and 3.
- 5 When prompted, select the option to run Windows NT VGA mode.
- 6 This enables Windows NT to start with the Last known good configuration (after three failed restart attempts pcAnywhere switches to Fault Tolerant start mode).
- 7 If the message A video compatibility problem caused pcAnywhere32 to switch to "Compatibility" video mode appears, click OK.
- 8 Uninstall pcAnywhere. For more information, see the *Software Installation and Maintenance Guide*.

Access problems

You do not have rights to modify this file

This message appears if pcAnywhere is installed on an NTFS drive. The permissions on the pcAnywhere data folder are set incorrectly.

- 1 Exit pcAnywhere.
- 2 Use Windows NT Explorer to browse to the path
`windows\Profiles\All Users\Application\Data\Symantec\pcAnywhere`
where *windows* is WinNT3.5 (if you have converted your server OS from Windows NT 3.51) or WinNT.
- 3 Right-click in the folder window, and choose Properties.

- 4 Click the Security tab.
- 5 Click Permissions.
- 6 Select Administrators, and set the type of access to Full Control.
- 7 Check the Replace permissions on existing files.
- 8 Click OK.
- 9 Click OK to exit the Properties property sheet.

PCI installation tips

Checklist

Here are two useful PCI tips:

- Reserve interrupts (IRQs) and memory addresses specifically for ISA adapters. This prevents PCI cards from trying to use the same settings that ISA cards are using. Use the SCU to keep track of the ISA adapter resources.
- Certain drivers might require interrupts that are not shared with other PCI drivers. The SCU can be used to adjust the interrupt numbers for PCI devices. For certain drivers, you might have to alter settings so that interrupts are not shared. Interrupt sharing is not supported on this platform.

Glossary

A

accelerator key

A key on a phoneset that an agent can use to place a call quickly. When an agent presses an accelerator key, the system places the call to the configured number associated with the key. For example, if an agent presses the Emergency key, the system places a call to the agent's supervisor.

access class

A collection of access levels that defines the actions a member of the access class can perform within the system. For example, a member of the Administrator access class might be given a collection of Read/Write access levels.

access level

A level of access or permission given to a particular user for a particular application or function. For example, a user might be given View Only access to historical reports.

ACCESS link

A communication channel between the Symposium Call Center Server and Meridian Mail.

ACCESS voice port

A Meridian Mail voice port that is controlled by the ACCESS link.

ACD call

See Automatic call distribution call.

ACD-DN

See Automatic call distribution directory number.

ACD routing table

See Automatic call distribution routing table.

acquired resource

A resource configured on the switch that is under the control of the Symposium Call Center Server. Resources must be configured with matching values on both the switch and the Symposium Call Center Server.

activated script

A script that is processing calls or is ready to process calls. Before you can activate a script, you must first validate it.

activity code

A number that an agent enters on his or her phoneset during a call. Activity codes provide a way of tracking the time agents spend on various types of incoming calls. For example, the activity code 720 might be used to track sales calls. Agents can then enter 720 on their phonesets during sales calls, and this information can be generated in an Activity Code report.

administrator

A user who is responsible for maintaining the Symposium Call Center Server.

agent

A user who is responsible for handling customer calls.

agent logon ID

A unique identification number assigned to a particular agent. The agent uses this number when logging in. The agent ID is not associated with any particular phoneset.

agent to skillset assignment

A matrix that, when you run it, sets the priority of one or more agents for a skillset. Agent to skillset assignments can be scheduled.

agent to supervisor assignment

A definition that, when you run it, assigns one or more agents to specific supervisors. Agent to supervisor assignments can be scheduled.

application

1. A logical entity that represents a Symposium Call Center Server script for reporting purposes. The master script and each primary script have an associated application. The application has the same name as the script it represents. 2. A program that runs on a computer.

application program interface

A set of routines, protocols, and tools that programmers use to develop software applications. APIs simplify the development process by providing commonly used programming procedures.

associated supervisor

A supervisor who is available for an agent if the agent's reporting supervisor is unavailable. *See also* reporting supervisor.

Automatic call distribution call

A call to an ACD-DN. ACD calls are distributed to agents in an ACD group based on the ACD routing table on the switch.

Automatic call distribution directory number

DNs associated with an ACD group. Calls made to these DNs are distributed to agents belonging to the group, based on the ACD routing table on the switch.

Automatic call distribution routing table

A table configured on the switch that contains a list of ACD-DNs used to define routes for incoming calls. This ensures that incoming calls not processed by Symposium Call Center Server are queued to ACD groups and handled by available agents.

C**call age**

The amount of time a call was waiting in the system before being answered by an agent.

call destination

The site to which an outgoing network call is sent. *See also* call source.

call intrinsic

A script element that stores call-related information assigned when a call enters the Symposium Call Center Server. *See also* intrinsic, skillset intrinsic, time intrinsic, and traffic intrinsic.

call presentation class

A collection of preferences that determines how calls are presented to an agent. A call presentation class specifies whether a break time between calls is allowed, whether an agent can put DN calls on hold for incoming ACD calls, and whether an agent phoneset displays that the agent is reserved for a network call.

call priority

A numerical value assigned in a script that defines the relative importance of a call. If two calls are in the queue when an agent becomes available, and one call is queued with a higher priority than the other, the agent receives the higher priority call first. *See also* skillset priority.

call source

The site from which an incoming network call originates. *See also* call destination.

call treatment

A script element that enables you to provide handling to a call while it is waiting to be answered by a call center agent. For example, a caller can hear a recorded announcement or music while waiting for an agent.

call variable

A script variable that applies to a specific call. A call variable follows the call through the system and is passed from one script to another with the call. *See also* global variable, variable.

Calling Line Identification

This is an optional service that identifies the telephone number of the caller. This information can then be used to route the call to the appropriate agent or skillset. The CLID can also be displayed on an agent's phoneset.

CDN

See controlled directory number.

CLAN

See Customer local area network.

CLID

See Calling Line Identification.

client

The part of Symposium Call Center Server that runs on a personal computer or workstation and relies on the server to perform some operations. *See also* server.

command

A building block used with expressions, variables, and intrinsics to create scripts. Commands perform distinct functions, such as routing a call to a specific destination, playing music to a caller, or disconnecting a caller.

controlled directory number

A special directory number that allows calls arriving at the switch to be queued when the CDN is controlled by an application such as Symposium Call Center Server. When a call arrives at this number, the switch notifies the application and waits for routing instructions, which are performed by scripts in Symposium Call Center Server.

Customer local area network

The LAN to which your corporate services and resources connect. The Symposium Call Center Server and client both connect to the CLAN. Third-party applications that interface with the server also connect to this LAN.

D**DBMS**

Database Management System

deactivated script

A script that does not process any new calls. If a script is in use when it is deactivated, calls continue to be processed by the script until they are completed.

default activity code

The activity code that is assigned to a call if an agent does not enter an activity code manually, or when an agent presses the activity code button twice on his or her phoneset. Each skillset has a defined default activity code.

default skillset

The skillset to which calls are queued if they have not been queued to a skillset or a specific agent by the end of a script.

desktop user

A configured user who can log on to the Symposium Call Center Server from a client PC.

destination site

The site to which an outgoing network call is sent. *See also* source site.

DHCP

See dynamic host configuration protocol.

Dial-Up Networking

See Remote Access Services.

Dialed Number Identification Service

An optional service that allows Symposium Call Center Server to identify the phone number dialed by the incoming caller.

An agent can receive calls from customers calling in on different DNISs and, if the DNIS is displayed on the phoneset, can prepare a response according to the DNIS.

directory number

The number that identifies a phoneset on a switch. The directory number (DN) can be a local extension (local DN), a public network telephone number, or an automatic call distribution directory number (ACD-DN).

directory number call

A call that is presented to the DN key on an agent's phoneset.

display threshold

A threshold used in real-time displays to highlight a value below or above the normal range.

DN

See directory number.

DN call

See directory number call.

DNIS

See Dialed Number Identification Service.

dynamic host configuration protocol

A protocol for dynamically assigning IP addresses to devices on a network.

dynamic link library

A library of executable functions or data that can be used by a Windows application. Typically, a DLL provides one or more particular functions, and a program accesses the functions by creating either a static or dynamic link to the DLL. A DLL can be used by several applications at the same time.

E**ELAN**

See embedded local area network.

embedded local area network

A dedicated Ethernet TCP/IP LAN that connects the Symposium Call Center Server and the switch.

Emergency key

A key on an agent's phoneset that, when pressed by an agent, automatically calls his or her supervisor to notify the supervisor of a problem with a caller.

event

1. An occurrence or action on the Symposium Call Center Server, such as the sending or receiving of a message, the opening or closing of an application, or the reporting of an error. Some events are for information only, while others can indicate a problem. Events are categorized by severity: information, minor, major, and critical. 2. An action generated by a script command, such as queuing a call to a skillset or playing music.

expression

A building block used in scripts to test for conditions, perform calculations, or compare values within scripts. *See also* logical expression, mathematical expression, and relational expression.

F**filter timer**

The length of time after the system unsuccessfully attempts to route calls to a destination site, before that site is filtered out of a routing table.

first-level threshold

The value that represents the lowest value of the normal range for a statistic in a threshold class. The system tracks how often the value for the statistic falls outside this value.

G**global settings**

Settings that apply to all skillsets or IVR ACD-DNs that are configured on your system.

global variable

A variable that contains values that can be used by any script on the system. The value of a global variable can only be changed in the Script Variable Properties sheet. It cannot be changed in a script. *See also* call variable, variable.

I**Incalls key**

The key on an agent phoneset to which incoming ACD and Symposium Call Center Server calls are presented.

Interactive voice response

An application that allows telephone callers to interact with a host computer using prerecorded messages and prompts.

Interactive voice response ACD-DN

A directory number that routes a caller to a specific IVR application. An IVR ACD-DN must be acquired for non-integrated IVR systems.

Interactive voice response event

A voice port logon or logoff. An IVR event is pegged in the database when a call acquires or de-acquires a voice port.

Internet Protocol address

An identifier for a computer or device on a TCP/IP network. Networks use the TCP/IP protocol to route messages based on the IP address of the destination. For customers using NSBR, site IP addresses must be unique and correct. The format of an IP address is a 32-bit numeric address written as four values separated by periods. Each value can be 0 to 255. For example, 1.160.10.240 can be an IP address.

intrinsic

A word or phrase used in a script to gain access to system information about skillsets, agents, time, and call traffic that can then be used in formulas and decision-making statements. *See also* call intrinsic, skillset intrinsic, time intrinsic, and traffic intrinsic.

IP address

See Internet Protocol address.

IVR

See Interactive voice response.

IVR ACD-DN

See Interactive voice response ACD-DN.

IVR event

See Interactive voice response event.

IVR port

See voice port.

L**LAN**

See Local area network.

Local area network

A computer network that spans a relatively small area. Most LANs connect workstations and personal computers and are confined to a single building or group of buildings.

local call

A call that originates at the local site. *See also* network call.

local skillset

A skillset that can be used at the local site only. *See also* network skillset, skillset.

logical expression

A symbol used in scripts to test for different conditions. Logical expressions are AND, OR, and NOT. *See also* expression, mathematical expression, and relational expression.

M**M1**

Meridian 1 switch

master script

The first script executed when a call arrives at the Symposium Call Center Server. A default master script is provided with Symposium Call Center Server, but it can be customized by an authorized user. It can be deactivated but not deleted. *See also* network script, primary script, script, and secondary script.

mathematical expression

An expression used in scripts to add, subtract, multiply, and divide values. Mathematical expressions are addition (+), subtraction (-), division (/), and multiplication (*). *See also* expression, logical expression, and relational expression.

Meridian Link Services

A communications facility that provides an interface between the switch and a third-party host application.

Meridian Mail

A Nortel Networks product that provides voice messaging and other voice and fax services.

Meridian MAX

A Nortel Networks product that provides call processing based on ACD routing.

MLS

See Meridian Link Services.

MM

See Meridian Mail.

music route

A resource installed on the switch that provides music to callers while they wait for an agent.

N

NACD call

A call that arrives at the server from a network ACD-DN.

NCC

See Network Control Center.

network call

A call that originates at another site in the network. *See also* local call.

Network Control Center

The server on a Symposium Call Center Server system where NSBR is configured and where communication between servers is managed.

network script

The script that is executed to handle error conditions for Symposium Call Center Server calls forwarded from one site to another, for customers using NSBR. The network script is a system-defined script provided with Symposium Call Center Server, but it can be customized by an authorized user. It can be deactivated but not deleted. *See also* master script, primary script, script, and secondary script.

Network Skill-Based Routing

An optional feature with Symposium Call Center Server that provides skill-based routing to multiple networked sites.

network skillset

A skillset that is common to every site on the network. Network skillsets must be created at the Network Control Center (NCC).

night mode

A skillset state in which the server does not queue incoming calls to the skillset, and in which all queued calls are given night treatment. A skillset goes into night mode automatically when the last agent logs off, or the administrator can put it into night mode manually. *See also* out-of-service mode, transition mode.

NPA

See Number Plan Area.

NSBR

See Network Skill-Based Routing.

Number Plan Area

Area code

O**object linking and embedding**

A compound document standard that enables you to create objects with one application and then link or embed them in a second application.

ODBC

See Open Database Connectivity.

OEM

Original equipment manufacturer

OLE

See object linking and embedding.

Open Database Connectivity

A Microsoft-defined database application program interface (API) standard.

out-of-service mode

A skillset state in which the skillset does not take calls. A skillset is out of service if there are no agents logged on or if the supervisor puts the skillset into out-of-service mode manually. *See also* night mode, transition mode.

out-of-service skillset

A skillset that is not taking any new calls. While a skillset is out of service, incoming calls cannot be queued to the skillset. *See also* local skillset, network skillset, and skillset.

P**PBX**

See private branch exchange.

pegging

The action of incrementing statistical counters to track and report on system events.

pegging threshold

A threshold used to define a cut-off value for statistics such as short call and service level. Pegging thresholds are used in reports.

PEP

See Performance Enhancement Package.

Performance Enhancement Package

A Symposium Call Center Server supplementary software application that enhances the functionality of previously released software by improving performance, adding functionality, or correcting a problem discovered since the original release.

personal directory number

A DN on which an agent can be reached directly, usually for private calls.

phoneset

The physical device, connected to the switch, to which calls are presented. Each agent and supervisor must have a phoneset.

phoneset display

The display area on an agent's phoneset where information about incoming calls can be communicated.

Position ID

A unique identifier for a phoneset, used by the switch to route calls to the phoneset.

primary script

A script that is executed or referenced by the master script. A primary script can route calls to skillsets, or it can transfer routing control to a secondary script. *See also* master script, network script, script, and secondary script.

private branch exchange

A telephone switch, typically used by a business to service its internal telephone needs. A PBX usually offers more advanced features than are generally available on the public network.

R**RAN**

recorded announcement

RAN route

See recorded announcement route.

RAS

See Remote Access Services.

recorded announcement route

A resource installed on the switch that offers a recorded announcement to callers.

relational expression

An expression used in scripts to test for different conditions. Relational expressions are less than (<), greater than (>), less than or equal to (<=), greater than or equal to (>=), and not equal to (<>). *See also* expression, logical expression, and mathematical expression.

Remote Access Services

A feature built into Windows NT and Windows 95 that enables users to log on to an NT-based LAN using a modem, X.25 connection, or WAN link. This feature is also known as Dial-Up Networking.

reporting supervisor

The supervisor who has primary responsibility for an agent. When an agent presses the Emergency key on the phoneset, the emergency call is presented to the agent's reporting supervisor. *See also* associated supervisor.

round robin routing table

A routing table that queues the first call to the first three sites in the routing table, then the second three sites, then the third three sites, and so on, until an agent is reserved at one of the sites. *See also* sequential routing table.

route

A group of trunks. Each trunk carries either incoming or outgoing calls to the switch. *See also* music route, RAN route.

routing table

A table that defines how calls are routed to the sites on the network. *See also* round robin routing table, sequential routing table.

S

sample script

A script that is installed with the Symposium Call Center Server client. Sample scripts are stored as text files in a special folder on the client. The contents of these scripts can be imported or copied into user scripts to create scripts for typical call center scenarios.

SCM

See Service Control Manager.

script

A set of instructions that relates to a particular type of call, caller, or set of conditions, such as time of day or day of week. *See also* master script, network script, primary script, and secondary script.

script variable

See variable.

second-level threshold

The value used in display thresholds that represents the highest value of the normal range for a given statistic. The system tracks how often the value for the statistic falls outside this value.

secondary script

Any script (other than a master, network, or primary script) that is referenced from a primary script or any other secondary script. There is no pegging of statistics for actions occurring during a secondary script. *See also* master script, network script, primary script, and script.

sequential routing table

A routing table method that always queues a call to the first three active sites in the routing table. *See also* round robin routing table.

server

A computer or device on a network that manages network resources. Examples of servers include file servers, print servers, network servers, and database servers. The Symposium Call Center Server is used to configure the operations of the call center. *See also* client.

service

A process that adheres to a Windows NT structure and requirements. A service provides system functionality.

Service Control Manager

A Windows NT process that manages the different services on the PC.

service level

The percentage of incoming calls answered within a configured number of seconds.

service level threshold

A parameter that defines the number of seconds within which incoming calls should be answered.

Simple Network Management Protocol

A set of protocols for managing complex networks. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network and then analyzing the responses.

site

1. A system using Symposium Call Center Server that can be accessed using SMI. 2. A system using Symposium Call Center Server and participating in Network Skill-Based Routing.

skillset

A group of capabilities or knowledge required to answer a specific type of call. *See also* local skillset, network skillset.

skillset intrinsic

A script element that inserts information about a skillset in a script. Skillset intrinsics return values such as skillsets, integers, and agent IDs. These values are then used in queuing commands. *See also* call intrinsic, intrinsic, time intrinsic, and traffic intrinsic.

skillset priority

An attribute of a skillset assignment that determines the order in which calls from different skillsets are presented to an agent. When an agent becomes available, calls might be waiting for several of the skillsets to which the agent belongs. The server presents the call queued for the skillset for which the agent has the highest priority.

source site

The site from which an incoming network call originates. *See also* destination site.

standby

In skillset assignments, a property that grants an agent membership in a skillset, but makes the agent inactive for that skillset.

supervisor

A user who manages a group of agents. *See also* associated supervisor, reporting supervisor.

switch

The hardware that receives incoming calls and routes them to their destination.

switch resource

A device that is configured on the switch. For example, a CDN is configured on the switch, and then is used as a resource with Symposium Call Center Server. *See also* acquired resource.

Symposium Call Center Server call

A call to a CDN that is controlled by the Symposium Call Center Server. The call is presented to the Incalls key on an agent's phoneset.

system-defined scripts

The Master_Script and the Network_Script (if NSBR is enabled). These scripts can be customized or deactivated by a user, but cannot be deleted. These scripts are the first scripts executed for every local or network call arriving at the call center.

T

target site

See destination site.

TCP/IP

See Transmission Control Protocol/Internet Protocol.

telephony

The science of translating sound into electrical signals, transmitting them, and then converting them back to sound. The term is used frequently to refer to computer hardware and software that perform functions traditionally performed by telephone equipment.

threshold

A value for a statistic at which system handling of the statistic changes.

threshold class

A set of options that specifies how statistics are treated in reports and real-time displays. *See also* display threshold, pegging threshold.

time intrinsic

A script element that stores information about system time, including time of day, day of week, and week of year. *See also* call intrinsic, intrinsic, skillset intrinsic, and traffic intrinsic.

Token Ring

A PC network protocol developed by IBM. A Token Ring network is a type of computer network in which all the computers are arranged schematically in a circle.

traffic intrinsic

An intrinsic that inserts information about system-level traffic in a script. *See also* call intrinsic, intrinsic, skillset intrinsic, and time intrinsic.

transition mode

A skillset state in which the server presents already queued calls to a skillset. New calls queued to the skillset are given out-of-service treatment. *See also* night mode, out-of-service mode.

Transmission Control Protocol/Internet Protocol

The communication protocol used to connect devices on the Internet. TCP/IP is the standard protocol for transmitting data over networks.

treatment

See call treatment.

trunk

A communications link between a PBX and the public central office, or between PBXs. Various trunk types provide services such as Direct Inward Dialing (DID trunks), ISDN, and Central Office connectivity.

U**user-created script**

A script that is created by an authorized user on the Symposium Call Center Server system. Primary and secondary scripts are user-created scripts.

user-defined script

A script that is modified by an authorized user on the Symposium Call Center Server system.

utility

A program that performs a specific task, usually related to managing system resources. Operating systems contain a number of utilities for managing disk drives, printers, and other devices.

V**validation**

The process of checking a script to ensure that all the syntax and semantics are correct. A script must be validated before it can be activated.

variable

A placeholder for values calculated within a script, such as CLID. Variables are defined in the Script Variable Properties sheet and can be used in multiple scripts to determine treatment and routing of calls entering the Symposium Call Center Server. See also call variable, global variable.

voice port

A connection from a telephony port on the switch to a port on the IVR system.

W**WAN**

See Wide area network.

Wide area network

A computer network that spans a relatively large geographical area. Typically, a WAN consists of two or more local area networks (LANs). The largest WAN in existence is the Internet.

workload scenarios

Sets of configuration values defined for typical patterns of system operations.

Five typical workload scenarios (entry, small, medium, large, and upper end) are used in the Capacity Assessment Tool for capacity analysis for the Symposium Call Center Server.

voice port
A connection from a telephone port on the router to a port on the VPK system.

WAN

Wide area network

Wide area network

A computer network that spans a relatively large geographical area. Typically, a WAN consists of two or more local area networks (LANs). The largest WAN in existence is the Internet.

Workload scenarios

Sets of configuration values defined for typical patterns of system operation. Five typical workload scenarios (many small machines, large and small and so on) are used in the Capacity Assessment Tool for capacity analysis for the system.